

Grasses of Bhubaneswar and neighbourhood¹

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(With a text figure)

INTRODUCTION

Owing to the meagreness of floristic reports on Orissa State after the works of Haines (1924), Mooney (1950) and Gamble and Fischer (1928) the necessity of plant exploration has been felt. Since hardly an area exists without graminaceous populations, a preliminary survey of grasses in and around the capital city of Bhubaneswar has been taken up.

Bhubaneswar is situated at 20° 3'N and 85° 8'E the ground sloping towards east. The western part of the city is therefore higher with hard soil and the eastern part is alluvial and low suitable for agriculture. Average annual rainfall is 152 cm, heaviest being in July. Annual mean maximum temperature is about 32°C with relative humidity around 70%.

Grasses are generally found in open areas, damp fields and edges of paddy fields. Some are found in sandy soils and even in hard rocky substratums. The kind of species and their distribution therefore differs regionally and seasonally, the rainy season supporting maximum.

The areas surveyed are given in Fig. 1. Collections were made all the year round by the senior author and were identified with aid of Bor's treatise (Bor 1960) and confirmed by the Botanical Survey of India, Calcutta. The voucher specimens are handed over to the Botany Department, Utkal University, Bhubaneswar.

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The salient features of the recorded species are given in the text arranged according to Bor's system (Bor 1960) of classification. The chromosome reports are the findings of the authors (Sharma *et al.* 1976).

The following is the enumeration of the species collected in the present survey with collection number, short notes on previous reports, morphology, and cytology.

GROUP : PANICOIDEAE

TRIBE : ANDROPOGONEAE

1. *Arthraxon sikkimensis* Bor, BNB 444.

A new report for Orissa. Spikelets laterally compressed and pedicelled, 2-nate, one sessile and another pedicelled, similar, on the articulate fragile rachis, glumes equal, lemma awned, 9 bivalents at meiosis ($2n = 18$).

2. *Bothriochloa intermedia* (R.Br.) A. Camus, BNB 415.

Syn. *Amphilophis glabra* (Roxb.) Stapf. Reported from Sijimali and Indragiri of Kalahandi district (Mooney 1950). Occurs in the rice fields opposite to the Regional Research Laboratory, Panicles with short primary axis.

3. *B. pertusa* (Willd.) A. Camus, BNB 448.

Syn. *Andropogon pertusus* (Linn.) Willd. A new report from Orissa. Occurs in the Rice fields. Water loving perennial

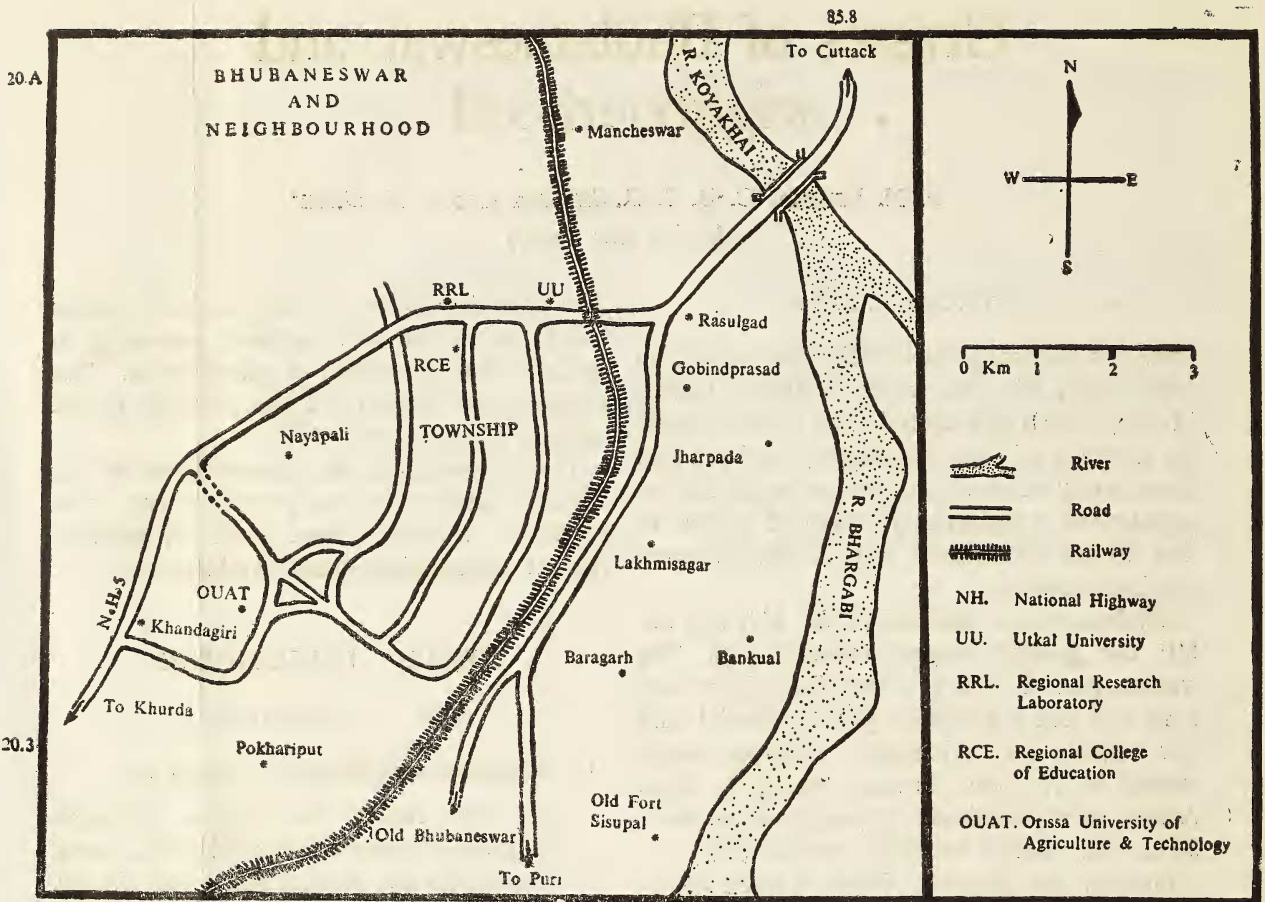


Fig. 1. Map of Bhubaneswar and its neighbourhood showing the Surveyed Areas.

herbs. Stems tufted and creeping all around. Leaves aggregated at the base of the stem and the flowering branches ascend from a geniculate base. Inflorescence consists of digitate spikes. An aneuploid ($2n = 4 \times = 36$) deficient by 2 chromosomes at haploid level, a variation from earlier reports.

4. *Chrysopogon aciculatus* Trin., BNB 424.

A new report from Orissa. Collected from the waste lands around the Utkal University and as weeds from rice fields. Perennials characterized by the spikelets being arranged in groups of three

at the ends of the branches of the panicle. Each group consists of one sessile and awned and two pedicelled but unawned spikelets.

5. *Pogonatherum paniceum* (Lamk.) Hack., BNB 464.

Syn. *P. saccharoideum* P. Beauv., New report from Orissa. Slender grasses with suberect narrow leaves and very slender peduncles with solitary terminal spikes.

6. *Vetiveria zizanioides* Nash., BNB 462.

Reported from Puri, Anugul and Sambalpur (Haines 1924). Densely tufted perennials

with erect and rigid leaves. Inflorescence is an erect conical panicle with reddish brown spikelets covered with thick based spines.

TRIBE : PANICEAE

7. *Alloteropsis cimicina* (Linn.) Stapf, BNB 431.

Reported from Sambalpur, Puri, Gunupur (Mooney 1950, Gamble & Fischer 1928). This species is characterised by 2-flowered spikelets in digitate spikes. Spikelets awned. A natural tetraploid with 18 (2x) bivalents.

8. *Brachiaria eruciformis* (J.E.S.) Griseb., BNB 459.

Reported from Champua of Keonjhar (Mooney 1950). It has one-sided racemose inflorescence and the position of the spikelet is adaxial. A natural tetraploid with 18 (2x) bivalents.

9. *B. kurzii* (Hook. f.) A. Camus, BNB 463.

A new report from Orissa. Stems weak and slender, leaves lanceolate and acuminate, ciliate and cordate base. One-sided racemose inflorescence with adaxial spikelets. An aneuploid ($2n = 4x = 32$) deficient by 2 chromosomes at haploid level which is a new report.

10. *B. ramosa* comb. nov. (Linn.) Stapf, BNB 422.

Syn. *Panicum ramosum* Linn. A new report for Orissa. Stems branched, nodes pubescent, leaves lanceolate. Inflorescence a panicle with erect spikes, spikelets pubescent.

11. *Digitaria adscendens* (H.B.K.) Henr., BNB 450.

New report for Orissa. Possess binate awnless spikelets jointed on the pedicels in

digitate spikes. New octoploid report. Aneuploid ($2n = 8x = 68$) with 2 chromosomes deficient at haploid level.

12. *Echinochloa colonum* (Linn.) Link., BNB 451.

Reported from Orissa (Gamble & Fischer 1928). Culms erect with spikelets secund on dense racemes with triquetrous rachis, nodes glabrous, leaf sheath up to 15 cm long, spikes 8-15, 1.3 to 2.5 cm long, spikelets yellowish white and 2 to 2.5 mm long.

13. *Hymenachne pseudointerrupta* C. Muell., BNB 461.

Reported from Kasipur and Kalahandi (Mooney 1950). Aquatic stout grasses with linear leaves. Panicles with lanceolate acuminate spikelets which articulate on their minute pedicels. 18 bivalents (2x) at meiosis which is a new report.

14. *Panicum austroasiaticum* Ohwi., BNB 416.

New report from Orissa. Spikelets symmetrical, pedicellate, pedicel much divided, new spikelets are continuously growing on the axis, herbaceous and membranous glumes, grains pale, and tightly enclosed by hardened glumes.

15. *P. miliare* Lamk., BNB 423.

A new report from Orissa. Cultivated species for its edible grain, leaves linear gradually tapered to the apex, glabrous, compound panicles suddenly acute, glumes amplexicaul.

16. *P. paludosum* Roxb., BNB 414.

Syn. *P. proliferum* Hook. f. non Lamk. Reported from Ganjam District (Gamble & Fischer 1928).

17. *P. psilopodium* Trin., BNB 465.

Reported from Ranpur of Puri District and Junagar of Kalahandi District

(Mooney 1950). A tufted grass, leaves linear, acuminate, sheaths with spreading hairs, panicles spreading, spikelets narrowly elliptic, glumes amplexicaul, spikelets are very commonly inhabited by an insect larva and then they became hypertrophied. A natural tetraploid with 18 bivalents.

18. *P. repens* Linn. BNB 443.

Reported from the sandy tracts of Puri; (Haines 1924). Stems creeping and stoloniferous, leaves glabrous, linear to lanceolate, spikelets mostly paired and unequally pedicelled, glumes hyaline, amplexicaul and membranous.

19. *Paspalidium flavidum* (Stapf) A. Camus, BNB 409.

Syn. *Panicum flavidum* Retz. Reported from Khurda of Puri Dist. (Haines 1924). Stems ascending, leaf sheaths inflated and compressed, leaves linear, spikelets ovoid, single terminal spike in case of small specimens, spikelets awnless, pale and glabrous.

20. *Paspalum scorbiculatum* Linn., BNB 454.

Reported from Kalahandi, Khariar (Mooney 1950) at 2700 ft. Annuals with erect tufted culms, leafy from the base to upwards. Inflorescence panicle, consisting of two false spikes with elliptic spikelets, in two rows on the under surface of the glabrous rachis. An aneuploid ($2n = 4x = 42$) with 1 extra chromosome at haploid level.

21. *Setaria, pallidifusca* (Schumach.) Stapf et Hubb., BNB 656.

A new report from Orissa. Terminal panicles often cylindrical with solitary spikelets seated on stunted branches which are more or less produced into bristles.

GROUP : POOIDEAE

TRIBE : ARISTIDEAE

22. *Aristida depressa* Retz., BNB 460.

Syn. *A. adscencionnis* Linn. Reported from Sambalpur (Mooney 1950). Common weed on sandy ground, leaves filiform and glabrous, inflorescence a panicle consisting of slender awnless spikelets.

TRIBE : CHLORIDEAE

23. *Chloris barbata* Sw., BNB 417.

Reported from Puri (Haines 1924). Inflorescence of digitate spikes seated at the top of the peduncle, spikelets awned and secund.

24. *Cynodon dactylon* (Linn.) Pers., BNB 447.

Syn. *Chloris cynodon* Trin. Cosmopolitan. Distribution in Orissa; wide spread. Creepers, some are ascending, leaves subulate, glabrous, spreading and linear. Inflorescence constitutes a group of spikes. Plant grows mostly on damp soil of drier parts.

TRIBE : ERAGROSTEAE

25. *Dactyloctenium aegyptium* (Linn.) Beauv., BNB 453.

Syn. *Eleusine aegyptiaca* Desf. Reported from Parlakimedi of Ganjam District (Srinivasan & Subbarao 1961). Annual with culms glabrous. Inflorescence of digitate spikes, radiating from the top of the culm. The rachis of the spike is sharply pointed. Spikelets many at right angles to rachis. An aneuploid ($2n = 4x = 52$) with 2 extra chromosomes at the haploid level.

26. *Eleusine coracana* (Linn.) Gaertn., in Cultivated.

27. *E. indica* (Linn.) Gaertn., BNB 455.
Reported from Puri (Haines 1924)
Spikelets awned, 2-3 seriate, on digitate capitata spikes, compressed with their sides to the rachis, flowering glumes several, unawned and greyish green.

28. *Eragrostis ciliaris* Link., BNB 407.
A new report from Orissa. Slender herbs with many ascending portions originate from a horizontal root stock. Leaves flat ascending.

29. *E. interrupta* Beauv. var. *diplachnoides* Stapf, BNB. 435.
Reported from Puri (Haines 1924). Stems stout and branched, panicles long.

30. *E. maderaspatana* Bor, BNB 449.
A new record from Orissa. Group of spikes constitute the panicle. Each spike consists of 4 to 5 spikelets. Each spikelet with 5/6 florets. The glumes are mid-veined and serrate margined. The lemma is three veined with veins ascending in obtuse awns, palea and stigma both feathery. A natural hexaploid ($2n = 6x = 60$) which is a new report.

31. *E. tenella* (Linn.) Roem. & Sch., BNB 457. Reported from Puri (Haines 1924), Parlakimedi of Ganjam Dist. (Srinivasan & Subbarao 1961). Slender grass with leaves convolute and acuminate, spikelets not very spongy, compressed, grains long ovoid and polished.

32. *E. unioloides* (Retz.) Nees ex Steud. BNB 442.
Cosmopolitan in distribution (Gamble & Fischer 1927), Parlakimedi (Srinivasan &

Subbarao 1961). Spikelets ovate much compressed, branches spreading, lemma and palea fallen from the base to the upwards, grains ellipsoid.

TRIBE : ORYZEAE

33. *Oryza sativa* Linn.
Cultivated.

TRIBE : PEROTIDEAE

34. *Perotis indica* (Linn.) O. Ktze., BNB 418.
Reported from Nayagarh, Keonjhar and Sambalpur (Mooney 1950). Slender annuals occurring in waste lands, leaves short, spikes feathery, spikelets narrow, awned and glumes unequal.

TRIBE : SPOROBOLAE

35. *Sporobolus indicus* auctt. non (Linn.) R.Br., BNB 458.
New report for Orissa. Leaves flat, small and minute, spikelets in effuse spiciform panicles.

TRIBE : TRITICEAE

36. *Triticum aestivum* Linn.
Cultivated.

DISCUSSION

Haines (1924) reported 214 species of grasses belonging to 90 genera and Mooney (1950) added 42 species more. Only a fraction of the 385 species reported by Gamble and Fischer (1928) from Madras Presidency have been collected from Ganjam District of Orissa. Out of the 36 species reported currently including the three cultivated grasses, belonging to 24 genera, 13 are new reports to Orissa state as they have not

been reported by earlier workers (Haines 1924 ; Mooney 1950 ; Gamble and Fischer 1928 ; Srinivasan & Subbarao 1961). The tribe Paniceae is dominant with 15 species followed by Eragrosteae with 8 species. Among the genera, however, both *Panicum* and *Eragrostis* are represented by 5 species each. It is interesting to note that a considerable number of the investigated species exhibit cytotypic differentiation (Sharma, Behera & Dash 1976).

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